DOCUMENT RESUME

ED 434 012 SE 062 840

AUTHOR Lewis, Jim
TITLE A Lesson on Climate Change.
INSTITUTION Florida State Dept. of Environmental Protection, Tallahassee.
PUB DATE 1999-01-00
NOTE 11p.
AVAILABLE FROM Florida Dept. of Environmental Protection, 3900 Commonwealth Blvd., MS 30, Tallahassee, FL 32399-3000; Tel: 850-488-9334.
PUB TYPE Guides - Classroom - Teacher (052)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Air Pollution; *Climate; Conservation Education; *Cooperative Learning; Critical Thinking; Earth Science; *Global Warming; *Greenhouse Effect; Meteorology; Science Activities; Secondary Education

ABSTRACT

This cooperative learning activity, for grades 7-12, promotes critical thinking skills within the context of learning about the causes and effects of climate change. Objectives include: (1) understanding factors that reduce greenhouse gases; (2) understanding the role of trees in reducing greenhouse gases; (3) identifying foods that produce greenhouse gases; (4) realizing the importance of personal responsibility to recycle; and (5) understanding the importance of being a responsible consumer. (CCM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED 434 012

A Lesson on Climate Change

Target Audience:

7th - 12th Grades
Environmental Studies (Biology/Life Sciences)

Introductory information:

This cooperative learning activity promotes critical thinking skills. Under a timed setting, students are expected to synthesize or express concepts towards solving the question posed at each lab station.

After all lab teams have passed through the lab stations, the teacher facilitates a class discussion on teams' responses to each station. Students should have reading material on the causes and effects of climate change, or should have devoted one or more class periods to discuss the subject. (See bibliography of reading materials and list of sites on the internet's World Wide Web.)

Class time: 45 minutes

Objectives: Students will:

- Understand that conservation of electricity, water, oil, and other resources reduces greenhouse gases.
- Understand the role of trees planted in their yard as a step toward reducing greenhouse gases.
- Identify foods that are energy costly and thus produce more greenhouse gases.
- Realize the importance of each individual taking the responsibility to recycle and that the concerted efforts of individuals do make a difference.
- Understand the importance of becoming a responsible consumer with regard to curbing the threat to global climate change.

Materials:

Run off copies of the text for each lab station.

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY
T. Valente
TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

BEST COPY AVAILABLE

A Lesson on Climate Change

Paste each copy to either a manila folder or poster board folded in half to make a station card which stands vertically.

Obtain the appropriate materials for each station:

- **Station 1** - a potted plant or tree.
- **Station 2** - an "On/Off" shower head connector or a low-flow shower head.
- **Station 3** - a compact fluorescent light bulb.
- **Station 4** - a bucket filled with recyclables.
- **Station 5** - reusable lunch and shopping bags.
- **Station 6** - a plastic and paper bag from the grocery store.
- **Station 7** - spark plug.
- **Station 8** - magazine photo of cow, beefsteak.
- **Station 9** - two bowls of fruit.
- **Station 10** - light switch.

(Also See **Suggestion for Extension and Integration at the end of the activity**.)

Procedures:

Divide the class by the number of stations to create your cooperative learning teams. Each team will decide who will record the team's responses to each station.

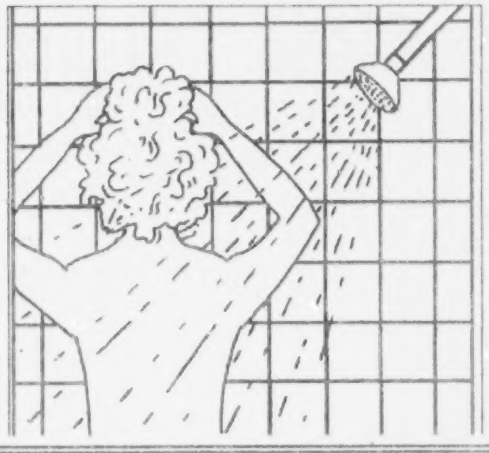
Explain to the class that they will have two minutes at each station. At the end of the two-minute period, the teacher will say **Stop** (or blow a whistle) and say, **Go to the next** station. Students will have five seconds to get to the next station.

Explain to the class that after all teams have gone through the stations, the class will sit with their team members and the teacher will facilitate a class discussion, soliciting teams' responses for sound, practical responses.

Below are the cards for each lab station:

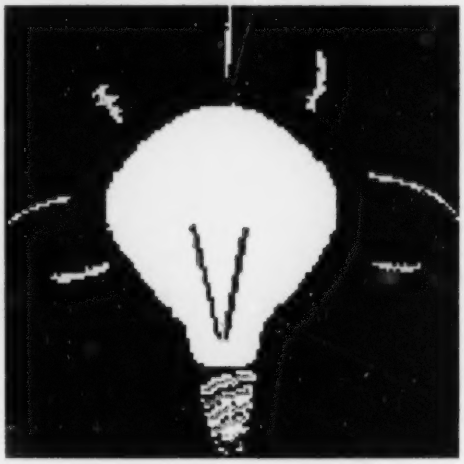
Station 1: "By taking responsibility and planting trees in your yard and your community, how will you help curb the threat of global climate change? List at least two ways."

Station 2: "By installing this device, how might you help curb the threat of global climate change? List at least three ways."



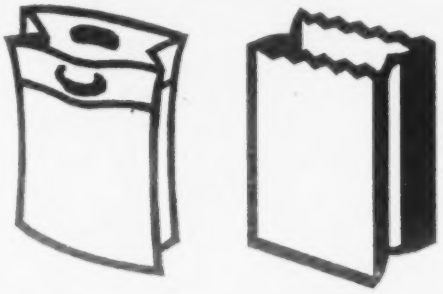
4

Station 3: "This compact fluorescent light runs on a fraction of the electricity that it takes to run the typical incandescent light bulb at right. And, it lasts longer. With your use of these compact fluorescent lights in your home, how might you be taking a step towards easing the threat of global climate change? List at least two ways. Is there another valid reason to use these? (Note: The last answer does not necessarily have to relate to climate change.)"



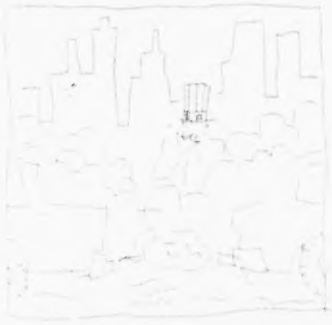
Station 4: "How does your effort to recycle in your daily life help ease the threat of global climate change? List at least two ways."

Station 5: "How does regular use of reusable lunch or shopping bags help curb the threat of global climate change? List at least two ways."

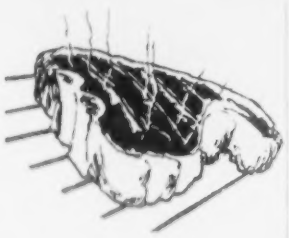


Station 6: "Paper or plastic or...? Keeping in mind what you have learned about global climate change, what is ultimately the best response to give the store clerk?"

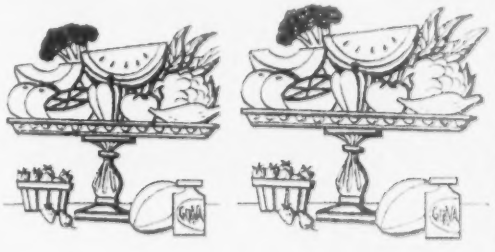
Station 7: "How might your keeping the car tuned regularly be a responsible step towards curbing the threat of global climate change? List at least two ways."



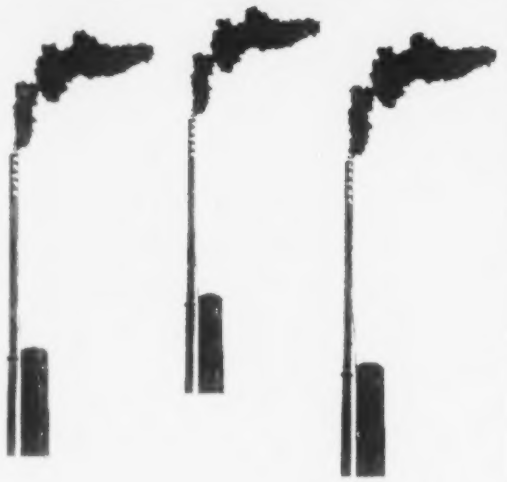
Station 8: "How might your reduction in consumption of beef be a responsible step in helping to reduce the threat of global climate change? List at least four ways."



Station 9: "Love fruit? So do I. The fruit in the left tray were grown in our state. However, the fruit in the right tray were grown in a foreign country and can be purchased in our stores seasonally. Which fruit should you buy to help curb the threat of global climate change? List at least two reasons."



Station 10: "How might remembering to always turn the lights off when leaving a room be a step towards curbing global climate change? List at least two ways."



Teacher answer key - Possible Team Responses To Each Station.

(Students may think of others.)

Station 1: (Planting Trees)

- Sink for Carbon dioxide.
- Shading the house -- uses less electricity (and therefore emissions) by not using the air conditioner.
- They are a wind barrier in winter, requires less heating (and therefore emissions) in the house.

Station 2: (Installing "On/Off" shower head connector)

- Uses less gas or electricity to heat water (thus reducing greenhouse emissions)
- Uses less water (takes less electricity or other fossil fuels to pump water to communities).
- By using less water, have more water for your trees!

Station 3: (Compact fluorescent lights)

- Uses less electricity (reduces greenhouse emissions).
- Equaled to 10 light bulbs thus uses less resources (this reduces emissions).

- Will not have to go to the store as often to buy lights (reduces emissions).
- Extra answer: They cost more to buy, but less to operate. In the long run, they save users money.

Station 4: (Recycling)

- Uses less resources (reduces emissions).
- Uses less energy for manufacturing (reduces emissions).

Station 5: (Reusable lunch/shopping bags)

- Saves trees (more sinks for emissions).
- Saves resources (reduces emissions).
- Reduces transportation of garbage to landfills (reduces emissions).

Station 6: (Paper or Plastic or...?)

- (see Station 5, above).

Station 7: (Keeping Car tuned regularly).

- Use less gas (reduces emissions).
- Life of car is extended (saves resources and energy -- reduces emissions).

Station 8: (Reduction in beef consumption)

- Fewer cows become processed beef to be transported (reduces emissions).
- Fewer cows -- less methane production (a greenhouse gas).
- Less packaging, less energy (reduces emissions).
- Less electricity due to reduced refrigeration costs (reduces emissions).

Station 9: (Fruit -- Buy in our state or foreign country?)

- Buying in-state reduces transportation, thus energy (reduces emissions).
- Less wear of materials from vehicles involved in transporting (conserves resources and energy -- thus reduces emissions).

Station 10: (Remembering to turn off lights in rooms)

- Saves electricity (reduces emissions).
- Saves light bulbs -- takes energy to manufacture them (reduces emissions).
- Saves trips to the store to buy bulbs (reduces emissions).
- Saves packaging of the bulbs (reduces energy, thus emissions).
- CO_2 emissions from the father yelling always to "TURN OFF THE LIGHTS!"

A Lesson on Climate Change

Suggestions for extensions and integration:

- You may wish to add or substitute stations that reflect the demographics and particular environmental concerns of your community.
- As a follow up activity you may wish to have each team come up with one or more of their own stations.
- As a homework assignment, students may write an oath that they will take regarding their efforts around their home to curb the threat to global climate change.
- As a homework assignment, students could research and disclose which cultures would not be affected by specific lab stations encountered in today's lab.

Bibliography

Publications:

Global Climate Change and Florida. Environmental Education Leaflet #8, Florida Department of Environmental Protection. 1998.

The Coming Climate, Scientific American. May 1997.

The Rising Seas, Scientific American, March 1997.

Our Changing Climate -- Reports to the Nation on Our Changing Planet. UCAR Joint Office for Science Support and National Oceanographic and Atmospheric Administration. Fall 1997. (See also: *http://www.ogp.noaa.gov/OGPFront/Edoutrch.html*)

Sites on the World Wide Web:

- **NOAA/Office of Global Programs:** *http://www.ogp.noaa.gov*. Information on NOAA-sposored research.
- **The U.S. Global Change Research Information Office:** *http://www.gcrio.org/*.
- **Information Unit of Climate Change, United Nations Environment Program:** *http://lacebark.ntu.edu.au/j_mitroy/sid101/uncc/fs-index.html*. Contains more than 90 fact sheets on all aspects of climate change.
- **Global Change Master Directory:** *http://gcmd.gsfc.nasa.gov/*.

Florida Department of Environmental Protection,
Office of Environmental Education
3900 Commonwealth Blvd., MS 30
Tallahassee, FL. 32399-3000
(850) 488-9334

DEPARTMENT OF ENVIRONMENTAL PROTECTION
FLORIDA

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

SE030840

ERIC

REPRODUCTION RELEASE

(Specific Document)

I. DOCUMENT IDENTIFICATION:

Title: A Lesson on Climate Change	
Author(s): Jim Lewis	
Corporate Source: DEP	Publication Date: 1/99

II. REPRODUCTION RELEASE:

In order to disseminate as widely as possible timely and significant materials of interest to the educational community, documents announced in the monthly abstract journal of the ERIC system, *Resources in Education* (RIE), are usually made available to users in microfiche, reproduced paper copy, and electronic media, and sold through the ERIC Document Reproduction Service (EDRS). Credit is given to the source of each document, and, if reproduction release is granted, one of the following notices is affixed to the document.

If permission is granted to reproduce and disseminate the identified document, please CHECK ONE of the following three options and sign at the bottom of the page.

The sample sticker shown below will be affixed to all Level 1 documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

1

Level 1

☑

Check here for Level 1 release, permitting reproduction and dissemination in microfiche or other ERIC archival media (e.g., electronic) *and* paper copy.

The sample sticker shown below will be affixed to all Level 2A documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE, AND IN ELECTRONIC MEDIA FOR ERIC COLLECTION SUBSCRIBERS ONLY, HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2A

Level 2A

☐

Check here for Level 2A release, permitting reproduction and dissemination in microfiche and in electronic media for ERIC archival collection subscribers only

The sample sticker shown below will be affixed to all Level 2B documents

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

Sample

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

2B

Level 2B

☐

Check here for Level 2B release, permitting reproduction and dissemination in microfiche only

Documents will be processed as indicated provided reproduction quality permits.
If permission to reproduce is granted, but no box is checked, documents will be processed at Level 1.

I hereby grant to the Educational Resources Information Center (ERIC) nonexclusive permission to reproduce and disseminate this document as indicated above. Reproduction from the ERIC microfiche or electronic media by persons other than ERIC employees and its system contractors requires permission from the copyright holder. Exception is made for non-profit reproduction by libraries and other service agencies to satisfy information needs of educators in response to discrete inquiries.

Sign here, please

Signature: Teri Valente	Printed Name/Position/Title: Teri Valente Adm Asst II
DEPARTMENT OF ENVIRONMENTAL PROTECTION 3900 COMMONWEALTH BOULEVARD / MS 30 TALLAHASSEE, FLORIDA 32399	Telephone: 850 488 9334
	FAX: 850 922 6645
	E-Mail Address:
	Date: 9/24/99

(over)